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NATIONAL SCIENCE FOUNDATION
ALEXANDRIA, VA 22314

HIGHER EDUCATION RESEARCH AND DEVELOPMENT SURVEY
FY 2021 Short Form

Please submit your survey data by January 31, 2022.

Your participation in this survey provides important information on the national level of R&D activity. The National Science Foundation (NSF) is authorized to collect this information under the National Science Foundation Act of 1950, as amended. Your institution's response is entirely voluntary.

Response to this survey is estimated to require 8 hours. If you wish to comment on the time required to complete this survey, please contact Suzanne H. Plimpton of NSF at (703) 292-7556, or e-mail splimpto@nsf.gov.

The Web address for submitting your data:

http://shortform.herdsurvey.org

Or mail this form to:

ICF
530 Gaither Road, Suite 500
Rockville, MD 20850

Questions?

Technical support:

Support@HERDsurvey.org
(866) 936-9376

General survey questions:

Michael Gibbons
National Center for Science and Engineering Statistics
National Science Foundation
mgibbons@nsf.gov
(703) 292-4590

Thank you for your participation.

What's New for FY 2021

Changes to Questions

Questions added to the FY 2020 survey about the impacts of the COVID-19 pandemic on R&D at your institution have been removed.

Survey Definitions and Instructions

This survey collects data on research and development (R&D) activities at higher education institutions. Please report R&D activities and expenditures for your institution's **2021** fiscal year.

Fiscal Year (FY)

Please report data for your institution's 2021 fiscal year.

Research and Development (R&D)

R&D activity is creative and systematic work undertaken in order to increase the stock of knowledge — including knowledge of humankind, culture, and society — and to devise new applications of available knowledge. R&D covers three activities defined below — basic research, applied research, and experimental development.

- **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
- **Applied research** is original investigation undertaken in order to acquire new knowledge. It is directed primarily towards a specific, practical aim or objective.
- **Experimental development** is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

R&D Expenditures

Include all expenditures for R&D activities from your institution's current operating funds that are separately accounted for. For purposes of this survey, R&D includes expenditures for organized research as defined by 2 CFR Part 200 Appendix III and expenditures from funds designated for research.

R&D ***includes:***	R&D does ***not*** include:
• Sponsored research (federal and nonfederal) • University research (institutional funds that are separately budgeted for individual R&D projects) • Startup, bridge, or seed funding provided to researchers within your institution • Other departmental funds designated for research • Recovered and unrecovered indirect costs (see definitions in Question 1) • Equipment purchased from R&D project accounts • R&D funds passed through to a subrecipient organization, educational or other • Clinical trials, Phases I, II, or III • Research training grants funding work on organized research projects • Tuition remission provided to students working on research	• Public service grants or outreach programs • Curriculum development (unless included as part of an overall research project) • R&D conducted by university faculty or staff at outside institutions that is not accounted for in your financial records • Estimates of the proportion of time budgeted for instruction that is spent on research • Capital projects (i.e., construction or renovation of research facilities) • Non-research training grants • Unrecovered indirect costs that exceed your institution's federally negotiated Facilities and Administrative (F&A) rate

Reporting Units	
Please ***include*** these components of your institution:	Please do ***not*** include:

• All units of your institution included in or with your financial statements, such as:
  • Agricultural experiment stations
  • Branch campuses
  • Medical schools
  • Hospitals or clinics
  • Research centers and facilities
  • A university 501(c)3 foundation
	• Federally Funded R&D Centers (FFRDCs). This information is collected separately. See the list of FFRDCs: http://www.nsf.gov/statistics/ffrdc/.
	• Other organizations or institutions, such as teaching hospitals or research institutes, with which your institution has an affiliation or relationship, but which are ***not*** components of your institution.
	• Other campuses headed by their own president, chancellor, or equivalent within your university system. Each campus is asked to respond separately.

Question 1. **How much of your total expenditures for research and development (R&D) came from the following sources in FY 2021? (See definition of R&D on the previous page.)**

- In rows a, b, c, d, and f: Include both **direct** and **recovered indirect costs** (reimbursement of F&A costs from external sponsors).
- Report the **original source** of funds, when possible.
- Include **all** fields of R&D (e.g., sciences, engineering, humanities, education, law, arts). See full listing on pages 10–12.

Source of funds	R&D expenditures (Dollars in thousands) *(for example, report $25,342 as $25)*
a. U.S. federal government Any agency of the United States government. Include federal funds passed through from another institution. Funds from FFRDCs should be treated as direct federal funding.	$_____
b. State and local government Any state, county, municipality, or other local government entity in the United States, including state health agencies. Include state funds that support R&D at agricultural and other experiment stations. *Public institutions* should report state appropriations restricted for R&D activities here rather than in row e, Institutional funds.	$_____
c. Business Domestic or foreign for-profit organizations. Report funds from a company's nonprofit foundation in row d.	$_____
d. Nonprofit organizations Domestic or foreign nonprofit foundations and organizations, except universities and colleges. Report funds from your institution's 501(c)3 foundation in row e1. Funds from other universities and colleges should be reported in row f.	$_____
e. Institutional funds	
1. Institutionally financed research All R&D funded by your institution from accounts that are only used for research. Exclude institution research administration and support (e.g., office of sponsored programs).	$_____ (Confidential[1])
2. Cost sharing Include committed cost sharing other than unrecovered indirect costs.	$_____ (Confidential[1])
3. Unrecovered indirect costs Calculate this amount as follows for your externally funded R&D only (preferably on a project-specific basis) using the appropriate cost rate—on-campus, off-campus, etc. • First, multiply the negotiated rate by the corresponding base. • Second, subtract recovered indirect costs.	$_____ (Confidential[1])
4. Total institutional funds[2]	$ TOTAL
f. All other sources Other sources not reported above, such as funds from foreign governments, foreign or U.S. universities, and gifts designated by the donors for research.	$_____
g. Total[2]	$ TOTAL

[1] Information from confidential items is not published or released for individual institutions; only aggregate totals will appear in publications. In accordance with the National Science Foundation Act of 1950, as amended, and other applicable federal laws, your responses will not be disclosed in identifiable form to anyone other than agency employees or authorized persons. Per the Federal Cybersecurity Enhancement Act of 2015, your data are protected from cybersecurity risks through screening of the federal information systems that transmit your data.

[2] Totals for rows e4 and g are automatically generated on the Web survey.

Question 1.1. Did you include the following types of funding in your responses to Question 1, row e1?

	Included
a. Competitively awarded internal grants for research Expenditures for organized research projects, involving a proposal or statement of work with expected research outcomes.	☐
b. Startup packages/bridge funding/seed funding Expenditures from funds provided to faculty members to begin or continue their research while seeking external sponsors.	☐
c. Other departmental funds designated for research Expenditures for research from other departmental or central accounts which do not match the descriptions provided in rows a or b.	☐
d. Tuition assistance for student research personnel University tuition assistance, waivers, or remission provided to students working on organized research. Please check “Included” even if these funds are reported as part of the expenditures included under rows a, b, or c.	☐

Question 2. **What were your FY 2021 R&D expenditures in the fields below? Please report federally funded expenditures in column (1) and all other expenditures in column (2).**

- Examples of the disciplines included under each field are provided on pages 10–12.

R&D Fields	R&D expenditures (Dollars in thousands) (1) Federal	(2) Nonfederal	(3) Total[1]
A. Computer and Information Sciences	$_____	$_____	$ TOTAL
B. Engineering	$_____	$_____	$ TOTAL
C. Geosciences, Atmospheric Sciences, and Ocean Sciences	$_____	$_____	$ TOTAL
D. Life Sciences	$_____	$_____	$ TOTAL
E. Mathematics and Statistics	$_____	$_____	$ TOTAL
F. Physical Sciences	$_____	$_____	$ TOTAL
G. Psychology	$_____	$_____	$ TOTAL
H. Social Sciences	$_____	$_____	$ TOTAL
I. Other Sciences	$_____	$_____	$ TOTAL
J. Non-S&E Fields	$_____	$_____	$ TOTAL
K. Total for All Fields of R&D[1]	$ TOTAL	$ TOTAL	$ TOTAL

Total in row k, column (1) should match total reported in Question 1, row a.

Total in row k, column (2) should match total reported in Question 1, rows b–f.

[1] Row and column totals are automatically generated on the Web survey.

Question 3. **How much of your R&D expenditures reported in Question 1 did your institution receive as a subrecipient from another U.S. university or college?**

Please report the original source of funds in columns (a) and (b).

The **subrecipient** for an award carries out the work but receives the funds from a pass-through entity rather than directly from the original funding source. Subrecipients tend to be the co-authors of publications, writers of technical reports discussing findings, inventors, etc. Do **not** include contractor or vendor relationships. A contractor or vendor receives payment for goods and services provided. See 2 CFR Part 200 Subpart D Section 330.

	Originating source of R&D expenditures (Dollars in thousands)		
Funds received from other U.S. higher education institutions	**(a) Federal**	**(b) Nonfederal**	**(c) Total[1]**
Include colleges and universities and units owned, operated, and controlled by such institutions.	$_____	$_____	$ TOTAL

[1] The row total is automatically generated on the Web survey.

Question 4. **How much of your R&D expenditures reported in Question 1 did your institution pass through to subrecipients at other U.S. universities or colleges?**

Please report the original source of funds in columns (a) and (b).

	Originating source of R&D expenditures (Dollars in thousands)		
Funds passed through to other U.S. higher education institutions	**(a) Federal**	**(b) Nonfederal**	**(c) Total[1]**
Include colleges and universities and units owned, operated, and controlled by such institutions.	$_____	$_____	$ TOTAL

[1] The row total is automatically generated on the Web survey.

Question 5. **In what month did your institution's 2021 fiscal year end?** _____

Primary Contact Information. Please complete the contact information for the person responsible for the survey.

Name _____

Job Title _____

Institution name _____

Office/Department _____

Mailing address (line 1) _____

Mailing address (line 2) _____

City, state, and ZIP Code _____

Phone number _____ E-mail address _____

Other Contact Information. List individuals who should be copied on all e-mails about the survey or can create a login account. Job Title should include information about office/department as appropriate (e.g., VP of Sponsored Programs, Department of Finance Manager, Analyst II in Grants Management).

Other Contact 1

Name _____

Job Title _____

Phone Number _____ E-mail address _____

Other Contact 2

Name _____

Job Title _____

Phone Number _____ E-mail address _____

Other Contact 3

Name _____

Job Title _____

Phone Number _____ E-mail address _____

EXAMPLES OF DISCIPLINES UNDER EACH R&D FIELD

A. Computer and Information Sciences

Artificial intelligence
Computer and information technology administration and management
Computer science
Computer software and media applications
Computer systems analysis
Computer systems networking and telecommunications
Data processing
Information sciences, studies
Information technology

B. Engineering

1. Aerospace, Aeronautical, and Astronautical Engineering

Aerodynamics
Aerospace engineering
Space technology

2. Bioengineering and Biomedical Engineering

Biological and biosystems engineering
Biomaterials engineering
Biomedical technology
Medical engineering

3. Chemical Engineering

Biochemical engineering
Chemical and biomolecular engineering
Engineering chemistry
Paper science
Petroleum refining process
Polymer, plastics engineering

4. Civil Engineering

Architectural engineering
Construction engineering
Engineering management, administration
Environmental, environmental health engineering
Geotechnical and geoenvironmental engineering
Sanitary engineering
Structural engineering
Surveying engineering
Transportation and highway engineering
Water resources engineering

5. Electrical, Electronic, and Communications Engineering

Communications engineering
Computer engineering
Computer hardware engineering
Computer software engineering
Electrical and electronics engineering
Laser and optical engineering
Power
Telecommunications engineering

6. Industrial and Manufacturing Engineering

Industrial engineering
Manufacturing engineering
Operations research
Systems engineering

7. Mechanical Engineering

Electromechanical engineering
Mechatronics, robotics, and automation engineering

8. Metallurgical and Materials Engineering

Ceramic sciences and engineering
Geophysical, geological engineering
Materials engineering
Metallurgical engineering
Mining and mineral engineering
Textile sciences and engineering
Welding

9. Other Engineering

Agricultural engineering
Engineering design
Engineering mechanics, physics, and science
Engineering physics
Engineering science
Forest engineering
Nanotechnology
Naval architecture and marine engineering
Nuclear engineering
Ocean engineering
Petroleum engineering

Other engineering fields that cannot be classified using the fields listed above

C. Geosciences, Atmospheric Sciences, and Ocean Sciences

1. Atmospheric Science and Meteorology

Aeronomy
Atmospheric chemistry and climatology
Atmospheric physics and dynamics
Extraterrestrial atmospheres
Meteorology
Solar
Weather modification

2. Geological and Earth Sciences

Earth and planetary sciences
Geochemistry
Geodesy and gravity
Geology
Geomagnetism
Geophysics and seismology
Hydrology and water resources
Minerology and petrology
Paleomagnetism
Paleontology
Physical geography
Stratigraphy and sedimentation
Surveying

3. Ocean Sciences and Marine Sciences

Biological oceanography
Geological oceanography
Marine biology
Marine oceanography
Marine sciences
Oceanography, chemical and physical

4. Other Geosciences, Atmospheric Sciences, and Ocean Sciences

Other fields that cannot be classified using the fields listed above

Examples of disciplines continue on next page.

D. Life Sciences

1. Agricultural Sciences

- Agricultural business and management
- Agricultural chemistry
- Agricultural engineering—report in Engineering
- Agricultural production operations
- Animal sciences
- Applied horticulture and horticultural business services
- Aquaculture
- Food science and technology
- International agriculture
- Plant sciences
- Soil sciences
- Veterinary biomedical and clinical sciences
- Veterinary medicine
- Wood science

2. Biological and Biomedical Sciences

- Allergies and immunology
- Biochemistry, biophysics, and molecular biology
- Biogeography
- Biology and biomedical sciences, general
- Biomathematics, bioinformatics, and computational biology
- Biotechnology
- Botany and plant biology
- Cell, cellular biology, and anatomical sciences
- Epidemiology, ecology and population biology
- Foods, nutrition, and wellness studies
- Genetics
- Microbiological sciences and immunology
- Molecular medicine
- Neurobiology and neuroscience
- Pharmacology and toxicology
- Physiology, pathology and related sciences
- Zoology, animal biology

3. Health Sciences

- Advanced, graduate dentistry and oral sciences
- Allied health and medical assisting services
- Bioethics, medical ethics
- Clinical medicine research
- Clinical/medical laboratory science/research and allied professions
- Communication disorders sciences and services
- Dentistry
- Dietetics and clinical nutrition services
- Health and medical administrative services
- Health, medical preparatory programs
- Gerontology, health sciences
- Kinesiology and exercise science
- Medical clinical science, graduate medical studies
- Medical illustration and informatics
- Medicine
- Mental health
- Nursing
- Optometry
- Osteopathic medicine, osteopathy
- Pharmacy, pharmaceutical sciences, and administration
- Podiatric medicine, podiatry
- Public health
- Radiological science
- Registered nursing, nursing administration, nursing research and clinical nursing
- Rehabilitation and therapeutic professions
- Zoology

4. Natural Resources and Conservation

- Fishing and fisheries sciences and management
- Forestry
- Natural resources conservation and research
- Natural resources management and policy
- Renewable natural resources
- Wildlife and wildlands science and management

5. Other Life Sciences

- Other life sciences that cannot be classified using the fields listed above

E. Mathematics and Statistics

- Applied mathematics
- Mathematics
- Statistics

F. Physical Sciences

1. Astronomy and Astrophysics

- Astronomy
- Astrophysics
- Planetary astronomy and science

2. Chemistry

(except Biochemistry—report in Biological and Biomedical Sciences)

- Analytical chemistry
- Chemical physics
- Environmental chemistry
- Forensic chemistry
- Inorganic chemistry
- Organic chemistry
- Organo-metallic chemistry
- Physical chemistry
- Polymer chemistry
- Theoretical chemistry

3. Materials Science

- Materials chemistry
- Materials science

4. Physics

- Acoustics
- Atomic, molecular physics
- Condensed matter and materials physics
- Elementary particle physics
- Mathematical physics
- Nuclear physics
- Optics, optical sciences
- Plasma, high-temperature physics
- Theoretical physics

5. Other Physical Sciences

- Other physical sciences that cannot be classified using the fields listed above

G. Psychology

- Clinical psychology
- Counseling and applied psychology
- Human development
- Research and experimental psychology

Examples of disciplines continue on next page.

H. Social Sciences

1. Anthropology

Cultural anthropology
Medical anthropology
Physical and biological anthropology

2. Economics

Agricultural economics
Applied economics
Business development
Development economics and international development
Econometrics and quantitative economics
Industrial economics
International economics
Labor economics
Managerial economics
Natural resources economics
Public finance and fiscal policy

3. Political Science and Government

Comparative government
Government
Legal systems
Political economy
Political science
Political theory

4. Sociology, Demography, and Population Studies

Comparative and historical sociology
Complex organizations
Cultural and social structure
Demography and population studies
Group interactions
Rural sociology
Social problems and welfare theory
Sociology

5. Other Social Sciences

Archeology
Area, ethnic, cultural, gender, and group studies
Cartography
Criminal science and corrections
Criminology
Geography
Gerontology, social sciences
History and philosophy of science and technology
International relations and national security studies
Linguistics
Public policy analysis
Regional studies
Urban studies, affairs

I. Other Sciences

Use this category for R&D that involves at least one S&E field (rows A–H) if it is impossible to report multidisciplinary or interdisciplinary R&D expenditures in specific fields.

J. Non-S&E Fields

1. Business Management and Business Administration

Business administration
Business management
Business, managerial economics
Management information systems and services
Marketing management and research

2. Communication and Communications Technologies

Communication and media studies
Communications technologies
Journalism
Radio, television, and digital communication

3. Education

Education administration and supervision
Education research
Teacher education, specific levels and methods
Teaching fields

4. Humanities

English language and literature, letters
Foreign languages and literatures
History
Humanities, general
Liberal arts and sciences
Philosophy and religious studies
Theology and religious vocations

5. Law

Law
Legal studies

6. Social Work

(no specific examples)

7. Visual and Performing Arts

Drama, theatre arts and stagecraft
Film, video, and photographic arts
Fine and studio arts
Music

8. Other Non-S&E Fields

Architecture
City, urban, community and regional planning
Family, consumer sciences and human sciences
Landscape architecture
Library science
Military technology and applied science
Parks, sports, recreation, leisure and fitness
Public administration and public affairs
Other non-S&E fields that cannot be classified using the fields listed above

Also, use this category for R&D that involves multiple non-S&E fields if it is impossible to report multidisciplinary or interdisciplinary R&D expenditures in specific fields.